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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/721,380

11/26/2003

Tae-Kon Kim

Q77929

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10/04/2007

SUGHRUE MION, PLLC

2100 PENNSYLVANIA AVENUE, N.W.

SUITE 800

WASHINGTON, DC 20037

EXAMINER

VIANA DI PRISCO, GERMAN

ART UNIT

PAPER NUMBER

2616

MAIL DATE

DELIVERY MODE

10/04/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/721,380

Applicant(s)

KIM, TAE-KON

Examiner

German Viana Di Prisco

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on July 24, 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young et al. (United States Patent No.: 6,990,116 B1)

Consider claim 1, Young et al. show and disclose a method for increasing overall network throughput over a wireless LAN wherein the access point (AP) can dynamically switch between distributed coordination function (DCF) and point coordination function (PCF) IEEE 802.11 access modes in response to the number of packets to be delivered in the queue at the AP (figure 6, abstract, column 8, lines 56-67, column 9, lines 1-6).

Art Unit: 2616

Young et al. further disclose that the length of the contention free period and thus the contention period can vary within the contention free period repetition interval depending on the load over the network (column 8, lines 16-19).

Even though Young et al. do not specifically disclose verifying that if there is still data to be transmitted in the queue and transmit said data before entering the contention mode, Young et al. teach that the length of the contention-free period can vary depending on the number of packets in the queue which suggests the emptying of the queue during the contention-free mode and before entering the contention mode.

Therefore it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to transmit the packets to be delivered in the queue of the access point before entering the contention period as disclosed by Young et al. in order to increase the overall network throughput.

Consider claim 2, and as applied to claim 1 above Young et al. show and disclose a method for increasing overall network throughput over a wireless LAN wherein the access point (AP) can dynamically switch between distributed coordination function (DCF) and point coordination function (PCF) IEEE 802.11 access modes in response to the number of packets to be delivered in the queue at the AP (figure 6, abstract, column 8, lines, 56-67, column 9, lines 1-6). Young et al. further disclose that the length of the contention free period and thus the contention period can vary within the contention free period repetition interval depending on the load over the network (column 8, lines 16-19).

Therefore it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, that once the factor that triggered the switch to PCF access mode, namely number of packets to be delivered in the queue at the AP, has been addressed, i.e. no more packets to be delivered in the queue at the AP, the access mode can switch back to DCF as disclosed by Young et al. in order to provide fair access to all users of the wireless LAN.

Consider claim 3, and as applied to claim 1 above, Young et al. disclose the IEEE 802.11 point coordination function (PCF) that allows a point coordinator at the access point to directly control access to the wireless medium and prevent any of the wireless stations from accessing the medium unless they are polled and given access to the medium by the access point (column 7, lines 42-52).

Consider claim 4, and as applied to claim 3 above, Young et al. disclose the IEEE 802.11 point coordination function (PCF) wherein the point coordinator at the access point controls the transmissions from all the stations by gaining control of the medium after a predetermined PCF interframe space (PIFS) at the beginning of the contention free period (column 7, lines 56-61). Young et al. further teach that the short interframe space (SIFS) has the highest priority for accessing the medium for sending acknowledgment frames (column 7, lines 64-67).

Consider claim 5, and as applied to claim 4 above, Young et al. disclose the IEEE 802.11 point coordination function (PCF) wherein the point coordinator at the

Art Unit: 2616

access point controls the transmissions from all the stations by gaining control of the medium after a predetermined PCF interframe space (PIFS) at the beginning of the contention free period (column 7, lines 56-61). Young et al. further teach that since PIFS is shorter than DIFS, the point coordinator can gain and maintain control during the contention free period by waiting a shorter time for access to the medium than the stations which must wait for a DIFS period (column 7, line 67- column 8, line 5).

Consider claim 6, and as applied to claim 4 above, Young et al. disclose that the receiving station checks the cyclic redundancy check of the received packet and sends an acknowledgment packet to the transmitting station, and that if the transmitting station does not receive the acknowledgement packet (a predetermined period of timeout is inherently taught), it will continue to retransmit until the transmission is successful up to a given number of retransmissions (column 6, line 63 – column 7, line 3).

Consider claim 7, and as applied to claim 6 above, Young et al. disclose that the receiving station checks the cyclic redundancy check of the received packet and sends an acknowledgment packet to the transmitting station, and that if the transmitting station does not receive the acknowledgement packet (a predetermined period of timeout is inherently taught), it will continue to retransmit until the transmission is successful up to a given number of retransmissions upon which point the packets are discarded (column 6, line 63 – column 7, line 3).

***Response to Arguments***

4. Applicant's arguments filed July 24, 2007 have been fully considered but they are not persuasive.

Applicant basically argues that Young et al do not teach the two features in claim

1. Regarding the first feature, the Applicant argues that "even if, *arguendo*, Young discloses verifying whether data remains in a queue of a point coordinator, there does not appear to be any teaching or suggestion of that particular operation being performed after a contention-free period is terminated".

To further clarify the Examiner's position, Young addresses the problem of increasing overall network throughput by exploiting the medium access mechanism following the IEEE 802.11 standard and its variations, and explicitly considers the size of the queue at the point coordinator (access point) when determining the medium access mechanism (see Abstract and col. 8, lines 56-67 and col. 9, lines 1-6).

Young also teaches in the flow chart 600 in figure 6 the steps to be followed in order to determine the optimum access mechanism in light of the load conditions in the network (e.g. the state of the buffers in the access point), (see figure 6 and col. 9, lines 24-27).

As cited by the Examiner in the Office Action (col. 8, lines 16-19 in reference to figure 5), Young teaches that the contention-free period can vary within the contention free period interval and teaches two ways of accomplishing this following the IEEE 802.11 standard and its variants. One of them makes use of the priority given to the an access point in accessing the medium. The access point exercises this priority after a

PCF (Point Coordination Function) interframe space or PIFS, (see col. 7, lines 42 – col. 8, line 5). The result in Young is the same one achieved by the Applicant in that the contention-free period, rather than being terminated is actually extended by exploiting the mechanism established in the IEEE 802.11 standard and its variants which gives the access point priority to access the medium and to establish the duration of the contention-free period.

Regarding the second feature the Applicant basically argues, "The teaching by Young that a length of the contention-free period can vary depending on a number of packets does not necessarily suggest that a queue is emptied before entering a contention mode". According to the Applicant, "Young could suggest. ...that a system attempts to facilitate the transmission of data by entering a contention mode while packets are left in a queue instead of waiting for the emptying of the queue".

Quite the contrary, Young makes use of the contention-free period to improve the throughput when the offered load exceeds that which can be carried in contention mode, and determines whether to enable the alternative contention-free mechanism by examining the state of the buffers (queues) in the access point (see col. 8, lines 47-54).

Even though Young may not explicitly teach emptying the queue of the access point, it would be obvious to a person of ordinary skill in the art to free the buffer space in the access point so that new data can be received and transmitted improving throughput.

Regarding claim 2 the Applicant basically argues "that the dependence of a contention-free period on the load over the network does not necessarily relate to a



Art Unit: 2616

verification of no data remaining in a queue. In fact, Young specifically describes that some factors that are considered in determining the load conditions include the number of transmissions, number of receptions, and number of collisions, however nowhere does Young disclose or suggest a factor of whether data remains in a queue of a point coordinator (PC) after a contention-free period (CFP) is terminated".

The Examiner respectfully disagrees with the Applicant because Young does explicitly describe among the factors that are considered in determining the load conditions the number of packets to be delivered in the queue (i.e. data remaining in a queue) at the access point (point coordinator) (see col. 9, lines 3-4).

Therefore, in view of the above reasons and having addressed Applicant's arguments, the previous rejection is maintained and made final by the Examiner.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2616

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hautala et al. (Unites States Patent Application Publication No.: 2004/0013134 A1) discloses a method for contention free traffic detection. Ho et al. (United States Patent No.: 6,999,442 B1) disclose a method for setting up a downstream communication session in a basics service set in a wireless LAN such that the communication session has a defined quality of service. Kim (Unites States Patent Application Publication No.: 2002/0085582 A1) discloses a method in a wireless LAN in which packets requiring real-time transmission take priority over other packets to be transmitted on a network. Benveniste (Unites States Patent Application Publication No.: 2002/0163933 A1) discloses a method for priority-based shared channel access.

6. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

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P.O. Box 1450  
Alexandria, VA 22313-1450

**Hand-delivered responses** should be brought to

Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Art Unit: 2616

Any inquiry concerning this communication or earlier communications from the examiner should be directed to German Viana Di Prisco whose telephone number is (571) 270-1781. The examiner can normally be reached on Monday through Friday 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*German Viana Di Prisco*  
September 26, 2007

  
**KENNETH VANDERPUYE**  
ASSISTANT PATENT EXAMINER